PROPOSED ADDITION OF ACUTE CARE NURSE PRACTITIONERS IN OBSERVATION UNITS: IDENTIFYING THE STAGE OF CHANGE OF STAFF COHORTS AT BANNER DESERT MEDICAL CENTER

by

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A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

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THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP Project prepared by Kacey Lohmann entitled "Proposed Addition of Acute Care Nurse Practitioners in Observation Units: Identifying the Stage of Change of Staff Cohorts at Banner Desert Medical Center" and recommend that it be accepted as fulfilling the DNP Project requirement for the Degree of Doctor of Nursing Practice.

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ACKNOWLEDGMENTS

Thank you to Banner Desert Medical Center, especially Jennifer Austin and the observation unit for the warm welcome and support during the data collection process. It was my pleasure to meet so many wonderful people and I wish the unit the best of luck moving forward with whatever care model best fits their needs. Thank you also to Shelly Fleiner and the Banner Desert Research Committee for their support in the development of this project.

To my advisor and DNP committee members, thank you for your emotional support and professional expertise. I could not have asked for a more supportive and brilliant group of people to guide me in this journey. To Dr. Shea, who was my first faculty contact at University of Arizona; Dr. Carlisle who supported me in clinical rotations and development of my clinical practice; and to Dr. Buchner who has been behind me through every IRB/ facility hurdle, comprehensive exams, every moment of self-doubt, and is always available for any crazy question I might have. I thank you all! You have elevated my practice and my standards for academic and professional excellence.

I cannot begin to express my love and appreciation to my parents, Allan and Gayle Stuber, and my friends for sustaining me throughout this entire process. Your humor, your wisdom, and your support uplifted me when I needed it most. Special thank you to Tia Foukas and Kati Wijdenes for reminding me always that there is a light at the end of the tunnel; to Karyn Hillman for being there for me since the beginning of this crazy venture; and to Paul Littley for always reminding me that “you got this”, and being available for a hug or a beer(s); whichever one was needed! Thank you all from the bottom of my heart!

DEDICATION

To my mother, Dr. Gayle Stuber, who has been my most steadfast supporter in all my life's many adventures and challenges. You continue to inspire me to achieve.

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ABSTRACT

Because of the expense associated with hospital admissions, the use of *observation* status has grown. One of the most consistently measured outcomes in observation is the patient length of stay (LOS). Research supports the positive impact that nurse practitioners (NP) have on LOS when added to other service lines that could be applied to observation. Banner Desert Medical Center (BDMC) is currently attempting to decrease their observation LOS. Adding acute care nurse practitioners (ACNP) to the care delivery model is a potential intervention. The purpose of this project was to develop an executive summary to inform staff of current evidence that supports the addition of ACNPs to observation. Then, via a survey, the project aimed to determine the level of staff support by identifying the Transtheoretical Model of Change (TTM) Stage of Change and to recommend appropriate stage-matched interventions for staff based on TTM processes of change.

The 10 Likert scale survey questions were adapted from two validated TTM surveys. The final question asked for the pros and cons of the intervention to determine the Decisional Balance (DB). The registered nurse (RN) cohort demonstrated consistently strong support for the proposed intervention with an average mean response of 6.57 on affirmative questions and a correspondingly low average mean of 2.2 on negative questions. When compared to the RN cohort, the physician cohort had lower mean responses with an average of 4.29 on every affirmative, a higher average mean response of 3.85 on the negatively worded questions. The DB for RNs was 19 pros to two cons. The DB for physicians was eight cons to three pros. These finding reflect that nurses are in the Preparation Stage of Change and are ready to move forward with adding ACNPs. An appropriate stage-matched intervention for registered nurses would be

the development of change teams. In contrast, the physician cohort is in the Precontemplation stage and is not ready to proceed with adding ACNPs. Appropriate stage-matched interventions for physicians would include facilitating consciousness-raising activities such as an open forum to communicating information about the proposed change and to explore concerns and questions regarding the intervention.

INTRODUCTION

Background Knowledge

Development of Observation Status

Since the Affordable Care Act, hospitals are increasingly motivated to conserve cost and promote quality of care. Emergency Departments (ED) are crowded which allows little time for clinical observation. However, the decision-making process regarding inpatient admission is an increasingly complicated and potentially expensive choice (Napoli, 2014). This is no small part due to the initiatives by the Centers for Medicare and Medicaid Services (CMS) that result in expensive utilization review processes for admissions (Napoli, 2014). Because of the expense associated with hospital inpatient admissions, the use of *observation* status, an outpatient designation, has grown exponentially. CMS defines *observation* as a "well-defined set of specific, clinically appropriate services, which include ongoing short term treatment, assessment, and reassessment before a decision can be made regarding whether patients will require further treatment as hospital inpatients or if they are able to be discharged from the hospital" (Center for Medicare and Medicaid Services [CMS], 2015, Chapter 20.6). The decision whether to discharge or admit to inpatient status should be made within 48 hours, usually less than 24 hours (CMS, 2015). Patient complaints suitable for admission to observation status include chest pain, syncope, abdominal pain, skin and soft tissue infections, cardiac dysrhythmias, as well as many others (Napoli, 2014). Observation exists to increase clinical observation time for physicians to determine if a patient needs to be admitted to the hospital, or can be discharged home safely (Medicare, 2014). These services can be provided either within the emergency department or in another area of the hospital (Medicare, 2014). Since its inception, the use of observation for such

patients is being increasingly recognized as best practice and requires the commitment of staff and hospital resources (Ross et al., 2012). From 2001 to 2009, the number of observation patients has quadrupled (Napoli, 2014).

Observation and Length of Stay

As the use of observation for patients grows so too must the body of research to address the concerns of this unique population of patients in this unique setting. Of the measures typically evaluated, one of the most consistently measured outcomes is the patient length of stay (LOS). The primary reason for this is due to reimbursement regulations. Inpatient admissions are reimbursed under Medicare A, whereas outpatient services such as observation are billed using the Hospital Outpatient Prospective Payment System (OPPS), which is reimbursed under Medicare B (Centers for Medicare and Medicaid Services [CMS], 2015a). The "Two-Midnight Rule" was developed to guide inpatient vs observation admission and states that any anticipated stay of greater than 48 hours is reasonable to qualify for inpatient admission and can be expected to be reimbursed under Medicare Part A (CMS, 2015a). Therefore, any stays anticipated to be less than 48 hours, with some exceptions, qualify as outpatient and will be reimbursed in accordance with OPPS guidelines. However, in recent years, CMS identified a high frequency of beneficiaries being treated as outpatients in observation, who were receiving "extended" observation stays lasting beyond this time frame (CMS, 2015a). This is a concern in terms of reimbursement for hospitals because Medicare pays hourly for observation status services up to 24 hours, it does not reimburse separately for any hours billed over the 24-hour time frame, (American College of Emergency Physicians [ACEP], 2015). An additional concern with these extended observation stays is that beneficiaries may not qualify for skilled nursing facility (SNF)

placements after discharge if they have not been admitted as inpatients (Wright, 2013). For these reasons, it is essential to develop a highly efficient observation unit care delivery model to minimize unnecessary patient hours in observation, and achieve a timely facilitation of throughput either to patient discharge or patient transfer to inpatient admission.

Observation Unit Care Delivery Models

The care delivery model for observation units varies widely. Some hospitals integrate observation patients into general inpatient units while others have designated units for observation patients. The structure of designated observation units is ideally very collaborative and has a multidisciplinary approach to care, which promotes throughput and strives to reduce unnecessary patient stay hours. Currently, two-thirds of United States hospitals do not have designated observation units (Ross et al., 2013). A retrospective observational cohort study found a protocol driven designated observation unit has the highest level of evidence for favorable outcomes (Ross et al., 2013). This study estimates that designated observation units that are protocol driven would lead to a 28% reduction in LOS nationally, leading to savings $950 million nationally (Ross et al., 2013). Less than 0.1% of patients this type of observation units had stays longer than 48 hours compared to 6.9% in the U.S. (Ross et al., 2013).

Nurse Practitioners and Observation

Nurse practitioners (NP) are part of a broad group of advanced practice registered nurses (APRN) which also include clinical nurse specialists, certified registered nurse anesthetists, and certified nurse midwives (National Council of State Boards of Nursing [NCSBN], n.d.). The expansion of the APRN role into acute care settings is being driven in part by a national mandate to improve the United States healthcare system (Dubree, Jones, Kapu, & Parmley, 2015). NPs

have demonstrated successful integration in many areas of hospital practice as measured by patient experience and patient outcomes (McDonnell et al., 2014). In observation units, the multidisciplinary approach and the need for an understanding of hospital organization flow are well suited for the skills and model of care utilized by an acute care nurse practitioner (ACNP). ACNPs are registered nurses who have completed graduate level educational preparation as NPs (American Association of Critical Care Nurses [AACN], 2012). "The purpose of the ACNP is to provide advanced nursing care across the continuum of health care services to meet the specialized physiologic and psychological needs of patients with acute, critical, and/or complex chronic health conditions" (AACN, 2012, p. 6). ACNPs can effectively coordinate patient care with other team members that include consulting services and case management (Collins et al., 2014). This improved coordination of care permits a more cohesive management of patient care and promotes throughput either to transfer or discharge. Nurses often express a need to have provider consultation and care that is consistent and accessible and the addition of NPs into acute services helps meet this need (Collins et al., 2014). One study found that adding NPs to a trauma service decreased LOS, costs, and increased discharges (Collins et al., 2014). NP outcomes studied also include evidence for improved access to care, the quality of healthcare delivery, and cost effectiveness in terms of financial impact on the consumer and the healthcare system (Dubree et al., 2015).

Local Problem

Banner Desert Medical Center (BDMC) is a large urban hospital in the Phoenix metropolitan area and a part of the Banner Health system. BDMC defines observation patients as patients who are older than eighteen and exclude those whose length of stay is less than four

hours or greater than 96 hours, those with primary psychiatry diagnoses, obstetrical, maternal, or fetal medicine, and who will depart with an average length of stay less than 24 hours (LaFleur & Tong, 2016). BDMC is currently attempting to decrease the observation average length of stay (ALOS). Currently, the ALOS in the BDMC observation unit is 28.8 hours, with a target of 23.97, a 7% reduction, to maximize reimbursement for services (LaFleur & Tong, 2016). Other identified areas of local concern include high turnover of observation staff (RNs, case management, patient care assistants) (LaFleur & Tong, 2016). While all Banner facilities have the goal to decrease ALOS for observation patients to less than 24 hours, the care delivery model varies per facility. The current care delivery model for observation patients at BDMC consists of designated units and uses off unit physician coverage by a private hospitalist group. In other Banner Health facilities such as Boswell Medical Center, Del E. Webb Medical Center, and Casa Grande Medical Center, observation units have dedicated physicians, ACNPs, physician assistants (PA), or a combination of providers physically present on the unit. However, BDMC currently does use any type of dedicated on-unit advanced provider. Furthermore, some of the senior nursing leadership has expressed interest in exploring adding ACNPs to the current model of care (M. LaFleur, personal communication, February 22, 2016).

Project Purpose

The purpose of this project is: 1) to develop an executive summary to inform staff of current evidence that supports the hypothetical addition of ACNPs to the care delivery model in the observation unit at BDMC for the purposes of decreasing LOS; and, 2) to determine the level of staff support for this proposition by identifying the prevalent Transtheoretical Model of Change (TTM) Stage of Change via a survey.

DNP Project Questions

This project aimed to: 1) determine the TTM Stage of Change prevalent amongst staff members regarding the proposed intervention of adding ACNPs to the care delivery model in the observation units at BDMC; 2) identify if significant Stage of Change disparities exist between the staff roles (physician, registered nurses, senior leadership); 3) to identify the pros and cons in the view of the staff members regarding the proposed addition of ACNPs in order to determine the state of the Decisional Balance; and 4) based on identified stage of change, recommend appropriate stage-matched interventions for staff member groups.

FRAMEWORK AND SYNTHESIS OF EVIDENCE

Theoretical Framework

Complex Adaptive Systems

Banner Health is a large organization that shares a general vision and goals. However, BDMC and the observation unit within that facility have unique cultures with distinct needs and challenges that impact the social and professional systems within the larger organization. A theoretical framework that is helpful when examining complex organizations such as the Banner Health system is the study of complex adaptive systems (CAS). A CAS can be defined as a "collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that one agent's actions changes the context for other agents" (Plsek & Greenhalgh, 2001, p. 625). With any CAS, a degree of standardization, a shared organizational vision, and leading from the center are crucial for success (Porter-O'Grady & Malloch, 2015). Banner Health is a CAS with a shared organizational vision, however the local context of any subsystem (i.e., individual facilities) must

be addressed within that greater vision. These subsystems are unique in terms of culture and resources and a certain amount of autonomy, flexibility, and local control are necessary to maintain the integrity of the broader system (Porter-O'Grady & Malloch, 2015). The observation unit at BDMC is not identical in its needs to the observation units in other Banner facilities as the human components (nurses, patients, physicians), social systems, and non-human components (e.g., physical structure of the hospital, equipment) are unique. To address this problem, central leadership in successful CAS replaces complicated and specific plans with a strategy known as minimum specifications (Plsek & Wilson, 2001). Minimum specifications present general goals, but the means to that goal are developed by each hospital, or in some cases an individual unit, which allows for local contextual differences (Wilson & Holt, 2001). Therefore, while the observation units in all Banner facilities share the same general goals such as decreasing LOS to less than 24 hours, it would be incorrect to assume that the best means to achieve these goals are the same for each facility.

Transtheoretical Model of Change

A further pertinent theory that is gaining prominence when addressing change within an organization is the Transtheoretical Model of Change (TTM) (Proschaska, Prochaska, & Levesque, 2001). The TTM integrates several theoretical constructs crucial to guiding effective change and among these are: Stages of Change; Processes of Change, and Decisional Balance (Proschaska et al., 2001). The first of these, Stage of Change, is the most central organizing construct of TTM (Proschaska et al., 2001). Studies of individual change behaviors have shown that individuals progress through a series of stages when modifying a behavior: 1) Precontemplation - the individual is not planning to take action in the foreseeable future; 2)

Contemplation - the individual is getting ready to take action within six months; 3) Preparation - the individual is ready to take action quickly, usually within one month; 4) Action - individuals have made observable changes; and, 5) Maintenance - maintaining overt changes that were made over six months ago (Pro-Change Behavior Systems, Inc. [PCBS], 2016). When addressing a new change in an organization, understanding the Stages of Change in which staff reside is important, because people in the Precontemplation or Contemplation stages are likely to see change as imposed (Proschaska et al., 2001). These individuals are often resistant to the change if they are moved to the Action stage prematurely (Proschaska et al., 2001).

Once a stage is identified, the organization can implement appropriate stage-matched interventions based on the Processes of Change associated with each stage (Proschaska et al., 2001). Stage-matched interventions are more effective than inflexible action oriented interventions that do not allow for variation in individual or group readiness (Proschaska et al., 2001). These 10 processes include consciousness raising, helping relationships, dramatic relief, self-reevaluation, environmental reevaluation, and self-liberation (Proschaska et al., 2001. These processes when matched the appropriate Stage of Change can indicate activities, both covert and overt, that organizational leadership can use to guide staff further through the change process (Proschaska et al., 2001). Furthermore, choosing interventions appropriate to the Stage of Change allows all individuals/cohort groups to participate in the change process, even if they are not yet in the Action stage (Proschaska et al., 2001).

With any individual or organizational change, there are pros and cons associated with the change. In the context of the TTM, the collection of pros and cons of a change is referred to as *Decisional Balance* (Proschaska et al., 2001). Studies have demonstrated that this Decisional

Balance adjusts depending on the TTM Stage of Change (Proschaska et al., 2001). For example, in the Precontemplation stage, staff opinion is that the cons outweigh the pros and this is the overriding reason for resistance to a change initiative (Proschaska et al., 2001). In other words, staff perception is that the benefits of an intervention do not outweigh the risks. However, using stage-matched interventions, staff members can progress through the Stages of Change, alter the Decisional Balance, and by the Action stage the pros will outweigh the cons (Proschaska et al., 2001). There is always a chance that even with appropriate interventions, the pro to con ratio cannot be altered in an individual or in a group perspective. In this case, the proposed changes need to be reconsidered by management and sometimes need to be abandoned for an alternative course of action (Proschaska et al., 2001).

Theoretical Framework Summary

Both CAS and TTM as theoretical frameworks provide a solid basis for the goals of this project. These frameworks address the inherent variability and unique needs of the organization while respecting the experiences and perceptions of the individuals that comprise this organization. While incorporating an ACNP into the observation unit team may be effective in some facilities, the cons may outweigh the pros in the opinion of the staff members at BDMC. It will be crucial for senior leadership at BDMC to identify the where their staff are located in the Stage of Change continuum so that future interventions and Processes of Change can be appropriately matched. The TTM provides a firm foundation to guide progression through these stages with stage-matched interventions which may either change the Decisional Balance in the perceptions of the staff, or lead the organization in another direction entirely.

Concepts

A *dedicated provider* is defined for the purposes of this project as an on-unit advanced healthcare provider. This provider may be a physician, nurse practitioner, or physician's assistant. A dedicated provider for the observation unit would be responsible solely for observation patients, and would be physical present on the unit the majority of the day. The purpose of a dedicated provider is to be available to the observation staff for prompt delivery of care. The dedicated provider would also participate in multidisciplinary rounds.

BDMC is developing a quality improvement initiative to decrease the LOS in their observation units (LaFleur & Tong, 2016). The *Model for Improvement* is a simple and effective tool for accelerating improvement in a variety of settings. There are three fundamental components: aims, changes, and metrics (Institute for Healthcare Improvement [IHI], 2016). The first component is the *aim* which identifies what the organization is trying to accomplish (IHI, 2016). The second component is *changes* which classifies what interventions can be added that will result in improvement (IHI, 2016). The third and final component is *metrics* which specifies how the organization will know the added changes have resulted in improvement (IHI, 2016). The aim of the BDMC observation unit is to decrease average LOS and the proposed change is the addition of ACNPs to the care delivery model. This project will determine staff support for the proposed change with the purpose of providing guidance for the future direction of the BDMC quality improvement interventions to achieve their aim.

Synthesis of Evidence

A thorough review of the available evidence was performed from February 22, 2016-March 11, 2016 searching Cumulative Index to Nursing and Allied Health Literature (CINAHL),

MEDLINE: Pubmed and OvidSP, and the Cochrane Library. The following key words were used: nurse practitioners, acute care nurse practitioners, observation, observation units, nurse practitioner outcomes, and length of stay. Inclusion criteria for the searches included: adult population and the English language. No date range was specified due to the limited number of relevant results yielded with a narrow date range. A total of 284 articles were found using the above search techniques. Of these 284 articles, studies were excluded if outcomes were not relevant to the observation setting, did not involve nurse practitioner outcomes, or if the population was pediatric. In addition, related articles were identified in references list of search articles. After the above exclusions, a total of 10 articles were retained for evidence appraisal. (Appendix A). A second literature review was conducted at the project's conclusion in February 2017 using the same criteria as the initial search. An additional four studies were identified and integrated into the synthesis of evidence (Appendix B).

A Vanderbilt retrospective analysis found that LOS and risk-adjusted LOS were lower for NP teams than for teams that did not have NPs (Kapu, Kleinpell, & Pilon, 2014). This finding was consistent when compared to previous years' data for the same teams prior to adding NPs (Kapu et al., 2014). By reducing the LOS, NP teams saved the hospital approximately $28 million in charges, representing cost avoidance (Kapu et al., 2014). Another study at Vanderbilt explored the impact of adding experienced acute care nurse practitioners (ACNP) to a Level 1 trauma service on LOS, cost, and staff satisfaction (Collins et al., 2014). On average, the LOS decreased across the trauma service (ICU, stepdown and floor) by 0.55 days, with resulting reduction of $8,878,000 in hospital charges over six months (Collins et al., 2014). Finally, discharges by NPs from the stepdown unit increased by 21% when compared to physician

discharges over the same amount of time (Collins et al., 2014). ACNPs in the Vanderbilt pilot program ACNPs provided timely and efficient interventions for patients and participated in morning multidisciplinary rounds as well as the daily discharge meeting with the case managers and liaisons to rehabilitation centers and nursing home facilities (Collins et al., 2014). These meetings facilitated cohesive management of the discharge process (Collins et al., 2014). While the exact reason NP collaborative teams are associated with decreased LOS is not known, it is likely multifactorial due to a combination of the skills of NPs to work with family to promote home discharge, and the presence of a dedicated provider on a unit with the ability to participate in multidisciplinary rounds (Morris et al., 2012).

A limited number of systematic reviews are available that address NP outcomes in comparison to physicians or other healthcare providers. However, a review from 2011 examined available evidence from 1990-2008 comparing various outcomes for APRNs (Certified Nurse Midwives, Certified Registered Nurse Anesthetists, Clinical Nurse Specialists, and Nurse Practitioners) compared to physicians or teams that did not include APRNs (Newhouse et al., 2011). This review found a high level of evidence supporting equivalent outcomes compared to physician teams for patient satisfaction, patient self-reported perceived health, functional status, glucose control, hospitalization rates, and mortality (Newhouse et al., 2011). A second review found that NPs as a service had a positive impact on quality of care, patient satisfaction and waiting times in emergency departments (Jennings, Clifford, Fox, O'Connell, & Gardner, 2015). A retrospective study explored outcomes between trauma units managed by unit based NPs and more traditional resident run units and found that there were no significant differences in mortality or complications other than incidence of deep vein thrombosis (Morris et al., 2012).

This study also demonstrated that the number of patients discharged to home rather than to hospice or a facility was significantly higher in the NP managed unit (Morris et al., 2012). An Australian randomized controlled trial found no significant differences in waiting times, length of stay, patient returns within 48 hours, or use of evidence based guidelines between emergency department patients managed by NPs and those managed by standard emergency department care (Jennings, Gardner, O'Reilly, & Mitra, 2015)

The effectiveness of ACNPs as providers in observation units has not been well studied. In fact, there is limited research regarding the use of any dedicated providers to staff observation units. This is in large part due to the small number of facilities using this model of care. A 2003 survey indicated that only 21.4% of observation units used physician assistants (PA) or NPs as associated non-physician providers (Ross et al., 2012). When considering the use of non-physician providers, the question of patient safety and comparable patient outcomes is often cited as a concern. An observation study examining quality of care outcomes in an ED fast track unit demonstrated that follow up health status scores were comparable between emergency nurse practitioner (ENP) and physician groups, as were adverse events (Dinh et al., 2012). A retrospective analysis addressed the safety and efficacy of care provided by PAs in the emergency department observation unit (EDOU) at the University of Utah for chest pain and trauma patients (Sherwood et al., 2011). This study found no adverse events (intubations, loss of vital signs, deaths, missed injuries in 30 day follow up) in a fourteen-month period for medically complex patients cared for by PAs (Sherwood et al., 2011). A descriptive cohort study determined that ENPs showed high diagnostic accuracy in treating minor illnesses and injuries (Van der Linden, Reijnen, & De Vos, 2010). Furthermore, there were no significant differences

between nurse practitioners and physicians related to inappropriate management and missed injuries (Van der Linden et al., 2010). The cumulative research suggests that non-physician providers can provide safe and effective care to observation patients.

One multidisciplinary comparative study examined the contributions of ACNPs to medical management of critically ill patients in an intensive care unit (ICU) (Hoffman, Happ, Scharfenberg, Divirgilio-Thomas, & Tasota, 2004). The findings are extremely pertinent when considering the potential impact an ACNP might have in an observation unit because, similar to an ICU, an observation unit is highly collaborative and requires skillful coordination of care. This study revealed four main themes related to care delivered by ACNPs in the ICU: 1) accessibility, 2) competence/knowledge, 3) coordination and communication, and 4) system issues (Hoffman et al., 2004). Strong communication skills, comprehensive care coordination, and continuity were perceived as advantages ACNPs brought to the ICU collaborative model (Hoffman et al., 2004). Accessibility was also observed to be a strength of the ACNP by respiratory therapists and nurses in terms of being easy to approach, open to suggestions, and readily available on the unit during the day (Hoffman et al., 2004). A collective case study demonstrated that ACNPs had a positive impact on distributing workload and collaboration when added to medical, surgical, and orthopedic service lines (McDonnell et al., 2014). Furthermore, it was felt they improved staff knowledge, skills, and competence (McDonnell et al., 2014)

To be successful in a new role, an organization should promote an environment that allows NPs to practice to the full extent of their license and training, as is consistent with the recommendations of the Institute of Medicine (IOM) 2010 report (Dubree et al., 2015). This report emphasizes the critical role of advanced practice nurses to improve healthcare quality,

delivery, and cost effectiveness (Dubree et al., 2015). Therefore, in order to create the best environment for the successful adoption of any innovative change, it is necessary to explore stakeholder buy-in prior to implementation. While few studies have explored the perceptions and experiences of various health care stakeholder groups regarding collaboration with NPs in acute care settings, one survey of dayshift nurses in a trauma service found that 100% strongly agreed that NPs in their unit were knowledgeable about patient plan of care (POC), improved patient care, and that patient pain was better controlled (Collins et al., 2014). Furthermore, 96% of nurses surveyed strongly agreed patient families were better informed about the patient's POC following the addition of ACNPs to the multidisciplinary team (Collins et al., 2014).

Physician support of the NP as partner, collaborator, and provider is important in advancing the role of the NP in acute care settings. Physician buy-in is of importance to BDMC as this facility contracts with outside hospitalist physician groups to cover the observation unit, making the decision to hire ACNPs a choice of the physician group, not the facility (M. LaFleur, personal communication, February 22, 2016). A qualitative study, though limited by the small sample number, explored potential barriers to hiring nurse practitioners in emergency departments (McGee & Kaplan, 2007). All four of the emergency departments studied utilized outside physician groups to staff their EDs, thus making the decision to hire NPs the decision of the physician group instead of the facility (McGee & Kaplan, 2007). However, while physicians were not interviewed in this study to explore their perspectives on hiring NPs in EDs, physician reluctance to work with NPs was perceived as a barrier by all four ED managers (McGee & Kaplan, 2007). However, Collins et al. (2014) found that 76.9% of physicians strongly agreed that NPs helped improve work flow when added to a Level 1 Trauma service, 83% strongly

agreed that overall patient care was improved, and 100% agreed that throughput was improved. Hoffman et al (2004) found that physicians agreed that NPs in the ICU enhanced continuity of care, effectively focused on patients and families, and were committed to care of the critically ill.

In summary, collaborative teams with NPs are associated with significant cost savings and cost avoidance. This is due in large part to a reduction in patients' LOS by promoting throughput and participating in multidisciplinary rounds. The presence of an ACNP on a unit has the potential to enhance continuity of care and patient outcomes through increased provider accessibility, commitment to quality of care, and better communication with staff and families (Hoffman et al., 2004). Furthermore, an investigation of the perceptions and buy-in of stakeholders to adopt this change in care delivery model is needed prior to implementing the addition of ACNPs to the current care delivery model.

METHODS

Design

This project is part of an existing single center quality improvement initiative ultimately aimed at decreasing the average LOS in the observation unit at BDMC. The project aims to provide insight as to the readiness of the various groups of staff members to adopt the proposed change of adding acute care nurse practitioners (ACNPs) to the current care delivery model. Through an executive summary, staff members were educated on the BDMC quality improvement initiative aim and introduced to the proposed change (Appendix C). The executive summary synthesized current evidence regarding NP impact on LOS as well as other pertinent outcomes. The executive summary provided the rationale for proposing the addition of ACNPs to the care delivery model to improve LOS, and then the staff were evaluated by a survey

(Appendix D) to determine their current Stage of Change regarding the proposal. This project had a quantitative design that identified if the staff members were open to the proposed intervention and if a difference in Stage of Change was found between cohort groups (physicians, nurses, nurse managers).

Ethical Considerations

Respect for Persons

This project involved a voluntary survey of staff members at Banner Desert Medical Center. Because this project did not involve an intervention, and the data were collected anonymously the regulations for written consent did apply (Polit & Beck, 2008). However, an introductory statement was included stating the survey was voluntary, and providing information on how to contact the Institutional Review Board (IRB) with concerns. IRB consent for the project was obtained (Appendix E). Participant consent was assumed if the participant continued to take the survey. The project respected the participants involved using a couple of mechanisms. First, it was voluntary which maximized the autonomy of the participants. The stakeholder cohort members were handed a survey and participants had the option not to return the survey. The surveys were distributed in person to the individual participants to maximize the potential for participation. However, the project also attempted to lessen the perception of this individual contact as coercion by choosing not to hand collect the surveys after completion. The surveys packets included a pre-stamped envelope so the survey was returned anonymously. Using this method, it was unknown to the investigator which participants responded and which did not. It should be noted that the investigator worked with the physicians being surveyed in a past role as a registered nurse, but is unknown to the nurses or leadership teams. It is unknown how this

impacted the number or quality of responses. However, the data were unlinked to individual participants, which protected the opinions of the individual stakeholders. The data were linked to particular cohorts and the responses were presented collectively while the individual responses were protected for privacy. The cohort groups and individuals did not represent a vulnerable population as participants were capable of giving fully informed consent (Polit & Beck, 2008).

Beneficence

Participants must not be exposed to harm or discomfort during studies and it is important to realize that harm and discomfort are not limited to physical injuries (Polit & Beck, 2008). Harm can also be emotional, financial, or social (Polit & Beck, 2008). The project design did not endanger the participants' physical person in any way nor did it have the potential to damage them emotionally. It was stated on the data collection tool the participants' responses would in no way affect employment at BDMC (Appendix D). The objective was to determine opinions surrounding adding ACNPs to the care delivery model from the various observation stakeholder groups (physicians, managers, and registered nurses). This project was conducted with the permission of the observation unit director and the Banner Desert Nursing Research and Evidence Based Practice Committee and full disclosure of the objectives were provided (Appendix F). Full disclosure included a full description of the project's objectives, methods, the individual's right to refuse participation, and any risks or benefits (Polit & Beck, 2008).

There was minimal risk to the participants as participation was voluntary, responses were not traceable to an individual, the project proceeded with full support from administration and IRB, and no person's employment was in jeopardy for expressing an opinion on this proposed intervention. It should be noted that because the project author is an ACNP, there was a

possibility that this could bias the responses of the participants in favor of ACNPs. However, this risk was minimized by insuring anonymity of the individual responses. It should also be noted that the investigator is no longer an employee at BDMC and was unknown to the majority of participants. The benefits to the project were that cohort groups were given a chance to express opinions about an intervention that has the potential to improve their work environment and work flow. In summary, the risk/benefit ratio was acceptable.

Justice

This proposed intervention has the potential to directly improve the work flow and work environment for the participants in all cohorts. Full time registered nurses on the unit, hospitalist physicians that cover the observation unit, and observation nurse managers were given an opportunity to participate. Other observation cohort groups such as case management, respiratory therapists, and nursing assistants were not surveyed. These groups would be impacted to a degree if nurse practitioners are added to the care delivery model, but it would be to a lesser degree than the nurses, physicians, and nurse managers. Therefore, it was not unfair to exclude them from participation at this time. The three participant groups were included because they will work the most closely with the nurse practitioners.

Setting

BDMC is a 649-bed hospital in Mesa, Arizona providing a wide range of inpatient and outpatient services (Banner Cardon Children's Medical Center [BCCMC], n.d.). There are three designated observation units, two with 40 beds, and one with 20 beds. BDMC contracts with two outside hospitalist groups, Alliance and Apollo, as the attending providers on these units. The

current care delivery model has the patient in the care of an attending physician who also has other patients throughout the hospital.

Participants

Participants included three groups that work in the observation units: 25 attending physicians from the Alliance and Apollo Hospitalist groups; five nurse managers; and 48 full time registered nurses. Currently, no NPs are employed by the participants in other areas of BDMC hospital, though some NPs are employed by other private practice groups, or through Banner Medical Group (BMG).

Data Collection Tool

Quantitative data were collected using an 11-question survey. Questions 1-10 used a seven point Likert scale, with "strongly disagree" assigned one point, "disagree" two points, "somewhat disagree" three points "neither agree nor disagree" four points, "somewhat agree" five points, "agree" six points, and "strongly agree" seven points. The final question aimed to determine the Decisional Balance of staff through their identification of pros and cons. The same survey was submitted to all staff member groups (Appendix D). The survey questions were based on TTM constructs and the questions were adapted from two validated TTM surveys (Sarbandi et al., 2013) (University of Maryland, Baltimore County [UMBC], n.d.). Given that this was a new concept and a proposed change, it was assumed that participants would be in the Precontemplation, Contemplation, or Preparation Stages of Change, and therefore the questions focused on Processes of Change matched to these stages (Proschaska et al., 2001). These processes were: 1) *consciousness raising*, which addressed awareness of the problem and potential solutions; 2) *dramatic relief*, which addresses fears and emotions associated with the

change; 3) *self-reevaluation*, which addresses the recognition that the change was important to success and happiness; 4) *environmental reevaluation*, which appreciates that the change will have a positive impact on the work environment; and 5*) self-liberation*, which addresses commitment to change and the belief that a change can succeed (Proschaska et al., 2001). The survey questions associated with the Precontemplation stage addressed the following Processes of Change: consciousness raising (5,8, & 10); dramatic relief (4 & 7); and environmental reevaluation (2 & 6). Question one is a self-liberation question, which is associated with a more advanced stage, the Preparation stage. Question three addressed the self-reevaluation present in the Contemplation stage. Question eight, in addition to being a consciousness raising question, also addressed the effectiveness of the executive summary and its impact on survey responses.

It should be noted that it was requested by the facility that this proposed intervention be referred to as "hypothetical", rather than "proposed" or "possible" and that this survey was part of an academic project. The rationale given to the investigator was that for political and practical reason, senior leadership did not wish the participants to assume the addition of ACNPs was being actively considered by management because they did not want this misunderstanding negatively influencing any future attempts to implement this change. To accommodate this concern, the addition of ACNP is referred to as "hypothetical" in both the survey and the executive summary, and the survey disclosure clearly states that this intervention is not under active consideration (Appendix C & Appendix D).

Rationale for the Executive Summary

One of the processes for change matched to the earliest Stage of Change, Precontemplation, in the TTM is *consciousness-raising*. Consciousness-raising is considered an

experiential process, and involves an individual becoming more aware of a problem as well as potential solutions to the problem (Sarbandi, Niknami, Hidarnia, Hajizadeh, & Montazeri, 2013) (Proschaska et al., 2001). An individual in the Precontemplation stage is often in this stage because he or she is not well informed about the proposed change (PCBS, 2016). While a survey could be collected as a baseline line measure of support, it was the assumption of the investigator that information regarding the hypothetical intervention should be presented to participants. Consequently, the investigator developed a one-page executive summary of the current LOS data at BDMC, improvement targets set by leadership, and a brief synthesis of current evidence regarding NP outcomes and attached the summary to the data collection tool (Appendix B). This executive summary provided pertinent information to all individuals surveyed regardless of the participant role.

Data Collection Tool Disbursement

Initially, the data collection period was intended to be for six days over a two-week period in January 2017. However, this was extended to a period of nine days over the course of three weeks to maximize disbursement. The survey was distributed in paper form directly to participants by the primary investigator. The “in person” delivery method was chosen for the convenience of the participants and with the intent of increasing participation as an informal inquiry of several physicians and nurses at BDMC illuminated that these groups do not check or respond to emails on a regular basis. The completed surveys were returned via United States Postal Services in a provided pre-stamped envelope.

At the request of the facility, no staff names or contact information were released to the primary investigator to protect staff information. With the permission of the observation unit

director, the primary investigator was present at morning and evening pre-shift “huddles” for observation nursing staff, including registered nurses and nurse managers for a total of six days over a two-week period and disbursed surveys during this time with the attempt to reach all 48 nurses and five nurse managers. While the content of each contact with participants varied, the following was communicated during each exchange: 1) primary investigator credentials as a nurse practitioner and doctoral student at the University of Arizona; 2) data collection was part of a voluntary student project in cooperation with the observation unit; 3) the main goal of the project was to explore physician and nurse perspectives regarding the hypothetical intervention of adding nurse practitioners to the care delivery team at BDMC. At the request of the unit director, this data collection was preceded by an email sent to the observation unit nurses and nurse managers by the director informing the staff of the upcoming data collection and included a brief abstract of the project (Appendix G). Regarding physician survey disbursement, attempts were made to be present in different units of the hospital and at different times of day with the hopes of contacting more participants. The investigator did not approach physicians in restricted areas of the hospital such as the emergency department or the physician’s lounge. Physicians were approached individually by the primary investigator in public areas of the hospital. Every attempt was made to reach all members of each cohort group and three additional days of data collection were added to contact as many physicians as possible.

Budget

The costs associated with this project included envelopes, stamps, and the printing of the surveys. The stamps cost $39.20, and the printing and envelopes cost $81.39. The costs were covered by the primary investigator.

Data Analysis

Data were analyzed by the University of Arizona research scientist Dr. Alice Pasvogel using IBS SPSS Statistics software version 24 to provide descriptive statistics for questions one through ten. A univariate analysis provided distribution, central tendency, and dispersion of the data. Frequency distribution is displayed as percentages and minimum and maximum. Determination of the mean, median and mode for each question were the chosen methods to present the central tendency of the data. Standard deviation for each question was the chosen method to explore dispersion and variability. Pros and cons responses were counted on question eleven.

RESULTS

Of a total number of 78 possible participants, 67 participants, (87%), were given surveys. Surveys were disbursed to 47 of 48 registered nurses (97.9%); four of five nurse managers (80%), and 16 of 25 physicians (64%). Total survey return rate was 31 of 67 (46.2%); 17 of 47 nurses (36.2%); 7of 16 physicians (43.8%); and 1 of 4 nurse managers (25%). Six returned surveys were unidentified as to participant role (9%). The responses of the unidentified surveys and nurse manager surveys are included for data analysis, but only as part of comprehensive statistics. The unassigned surveys and the nurse manager survey were not analyzed as separate cohort groups for two reasons. First, the nurse manager response could not be analyzed separately to preserve anonymity of the single response. Second, as the goal of the project was to identify the stage of change of cohort groups, data that could not be designated to one of those groups had limited utility to the facility

Each question was analyzed separately, with the mean, mode, minimum and maximum response and standard deviation calculated for total participants (Appendix H) and for each specified cohort group (Appendix I). Apart from question seven and question ten, which were worded inversely, the higher the response per question, the more advanced the participant or cohort group was on the TTM Stage of Change continuum. Question eight also addressed the effectiveness of the executive summary. The questions addressing the more advanced Stage of Change, Contemplation, were question three, which explored self-reevaluation, and question nine which directly addressed the timeline of six-month readiness associated with the contemplation state. Again, higher numbers on these questions indicate a more advanced stage for the participant or cohort group. The physicians had lower mean responses than RNs when analyzed separately on all the affirmative responses, as well as higher means than the RNs on the negatively worded questions (Table 1). The standard deviation for physicians was also greater on every question compared to the RNs, with an average response of 1.83, indicating the minimum and maximum responses had greater variability (Appendix I).

TABLE 1. *Mean Responses for Registered Nurses and Physician Cohorts*

Survey Item	Agree (SA, A, SWA) Mean 5-7		Neutral Mean 4		Disagree (SD, D, SWD) Mean 1-3	
1) Open to working with ACNPs in the observation unit	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.82			**4.17**		
2) Believe current model of care could be more efficient	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.82	**6.14**				
3) Adding ACNPs would make my job easier	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.81					**3.71**

TABLE 1 – *Continued*

Survey Item	Agree (SA, A, SWA) Mean 5-7		Neutral Mean 4		Disagree (SD, D, SWD) Mean 1-3	
4) Excited about adding an ACNP to observation	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.82					**3.43**
5) Have read about ACNPs and impact on care and LOS	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.12			**4.14**		
6) Think ACNPs could reduce LOS	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.47			**4.29**		
7) Worry ACNPs could negatively impact patient care	RN	MD/DO	RN	MD/DO	RN	MD/DO
					1.81	**3.14**
8) Executive summary provided valuable information	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.2			**4.6**		
9) Ready to add ACNP within next six months	RN	MD/DO	RN	MD/DO	RN	MD/DO
	6.56					**3.86**
10) Need more information before adding ACNPs	RN	MD/DO	RN	MD/DO	RN	MD/DO
				4.57	**2.64**	

Frequencies for each question were calculated for total respondents and for the physician and registered nurse cohorts separately. The frequencies demonstrate a wider variability of responses from the physician cohort than from the registered nurse cohort (Table 2). Again, consistent inverse responses were demonstrated from each group on negatively worded items seven and ten.

TABLE 2. *Frequency of Response per Question*

Survey Item	% Agree (SA, A SWA)			% Neutral			%Disagree (SWD, D, SD)		
	All	Nurse	Physician	All	Nurse	Physician	All	Nurse	Physician
1) Open to working with ACNPs in the observation unit	86.6	100	33.4	3.3	*	16.7	10	*	50
2) Believe current model of care could be more efficient	100	100	100	*	*	*	*	*	*
3) Adding ACNPs would make my job easier	83.3	100	42.9	3.3	*	*	13.3	*	57.2
4) Excited about adding an ACNP to observation	83.8	100	28.6	3.2	*	14.3	13	*	57.2

TABLE 2 – *Continued*

Survey Item	% Agree (SA, A SWA)			% Neutral			%Disagree (SWD, D, SD)		
	All	Nurse	Physician	All	Nurse	Physician	All	Nurse	Physician
5) Have read about ACNPs and impact on care and LOS	80.7	88.3	57.2	9.7	5.9	14.3	9.7	5.9	28.6
6) Think ACNPs could reduce LOS	74.2	94.1	42.9	16.7	5.9	28.6	9.7	*	28.6
7) Worry ACNPs could negatively impact patient care	6.6	*	28.6	3.3	6.3	*	90	93.8	71.5
8) Executive summary provided valuable information	81.4	93.4	20	18.5	6.7	80	0	*	*
9) Ready to add ACNP within next six months	83.4	100	28.6	6.7	*	28.6	16.7	*	42.9
10) Need more information before adding ACNPs	24.9	14.2	57.2	17.9	21.4	14.3	56.9	64.2	28.6

The weight of the pros/cons of the Decisional Balance provides supportive information when determining the TTM Stage of Change for a cohort. To determine the Decisional Balance, the total number of pros of change versus the cons of change identified by the participants was tabulated for the comprehensive response, and for the registered nurse and physician groups (Figure 1). The further advanced a participant or cohort is on the TTM continuum, the more pros will outnumber the cons.

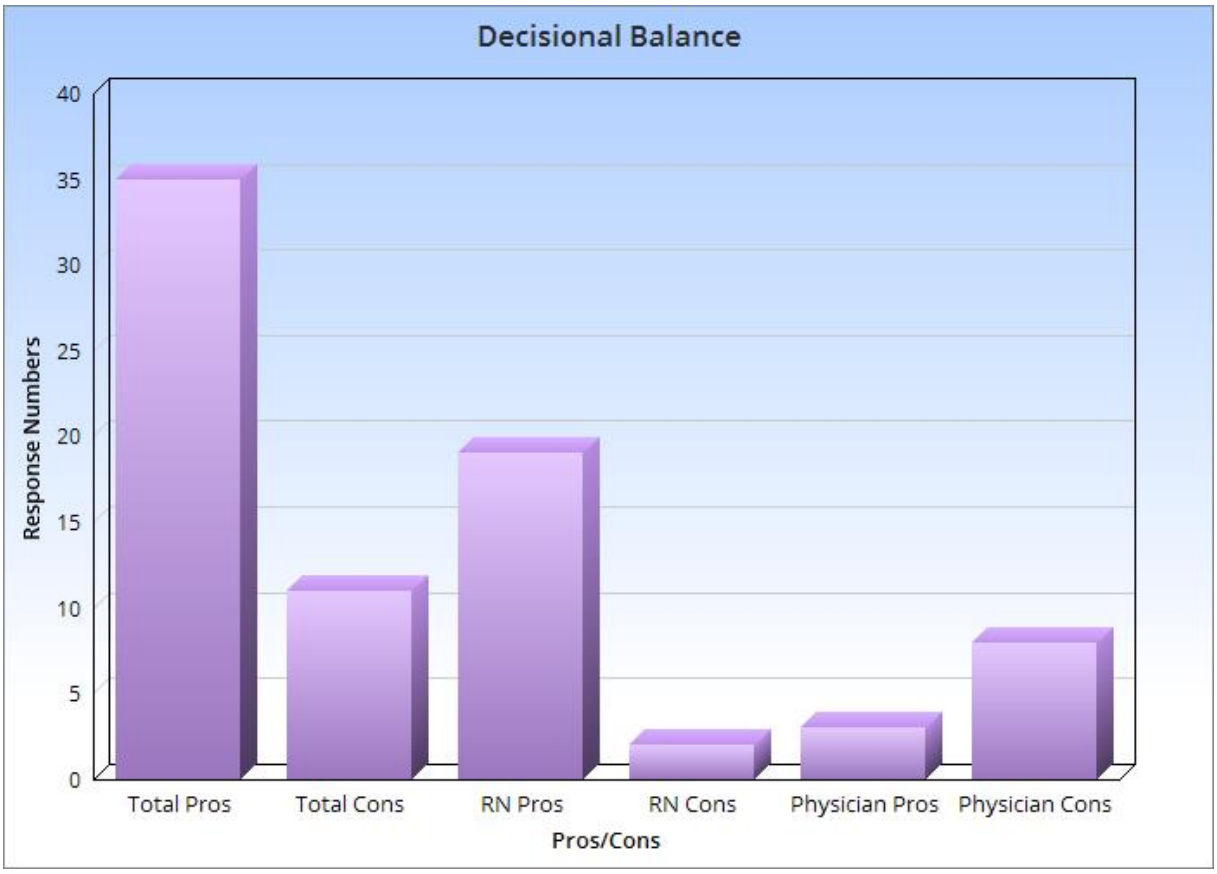

FIGURE 1. Number of Pros and Cons by Total Responses and by Cohort.

The nurse manager group and unassigned group were again not tabulated separately given the small sample number and limited use to the investigating facility. The overall all Decisional Balance weighed 35 pros compared to 11 cons. Physician Decisional Balance showed more cons, with eight identified versus three pros. Registered nurses put forward nineteen pros versus two cons in their decisional balance. Identified pros included “availability on unit,” “less pages,” “timely orders” and “faster care.” Cons identified were “increased liabilities,” “more ED dumps,” and “increased cost” (Appendix J).

DISCUSSION

Stages of Change for Staff Cohort Groups

Registered Nurses

The consistent responses of the registered nurse cohort demonstrated overwhelmingly that this group at a minimum is at Contemplation Stage of Change and likely is even in the Preparation stage. This means this group would support the hypothetical intervention of adding nurse practitioners to the care delivery model within the next six months. The group consistently answered every affirmative question for pre-contemplation and contemplation with an average score of 6.57. The group also demonstrated low scores on question 7 and 10, of 1.81 and 2.64 respectively, which explored concerns about nurse practitioners, and the need for more information prior to moving forward. These responses indicate the cohort does not feel the need for more information prior to moving forward with this proposed initiative, suggesting a higher comfort level with the addition of ACNPs to the care delivery model. The registered nurses demonstrated openness and excitement about working with ACNPs, expressed the feeling that working with ACNPs would make their jobs easier, and believe that ACNPs might decrease the LOS on the unit. The standard deviation of RN responses is less than 1.0 on 8/10 questions, with the greatest value of 1.317. This minimal variation of responses indicates a unified view across the RN cohort.

Given the consistent strength of the group responses and especially considering the strength of the Decisional Balance expressed by the cohort, this cohort is arguably in the Preparation stage of change. To be in the Preparation stage of the TTM, the participant is prepared to act within the next 30 days (Proschaska et al., 2001). Only one of the questions on

the survey addressed this Stage of Change, which was the first question addressing the openness of the respondent. The mean response for this question was 6.82, signifying strong agreement. The RN cohort also listed 19 pros in comparison to just two cons for adding ACNPs. In the TTM, the cons outweigh the pros in the Precontemplation stage; there is a crossover in the middle stages; and by the Action stage, the pros outweigh the cons (Proschaska et al., 2001). While the pros were not organized by theme for the purposes of this project, a common theme expressed in the pros related to the urgency with which the nurses felt the need for nurse practitioners in the care delivery model (Appendix J). Based on strength of these combined findings, the case is compelling that registered nurses are in Preparation and are ready to take action on this initiative.

Physicians

In contrast to the registered nurses, physician average responses consistently demonstrate as a group they are in the Precontemplation stage of change. The physician cohort average response for affirmative questions was 4.29, indicating indecision about adding ACNPs. The physicians had an average of 3.85 on questions seven and ten indicating a stronger concern than RNs about the impact ACNPs might have on quality of care, and needing more information before moving forward with any ACNP trial. The average physician response when asked if they would be ready to attempt a trial of ACNPs within the next six months was 3.86, which places this group as a whole in the Precontemplation stage of change per the TTM criteria. Placement in this stage is further reinforced by proportion of the Decisional Balance. Again, in the TTM, an increased number of cons identified over pros is seen in the early Stages of Change. The physicians identified eight cons compared to just three pros regarding adding ACNPs to the care

delivery model indicating they see more disadvantages than advantages. While one physician saw the benefit of "less pages," others were concerned by the possibility of "missed diagnoses," and increased pressure for more patients seen (Appendix J). However, it should be noted that there is a greater SD in the physicians' responses indicating a relatively wide variability in responses. Therefore, while the physicians as a cohort are in Precontemplation, there are some in this cohort who are more advanced on the continuum and would be ready to enact a change.

Accessibility

The original intention of the project to identify pros and cons of the proposed change was to determine the weight of the Decisional Balance in the TTM. However, after viewing the responses, there was a consistency observed in the pros identifying the need for an accessible provider. Of the 35 pros, 15 addressed accessibility, either explicitly or indirectly, by identifying an advantage to having a provider on the unit (Appendix J). Further comments by staff indicated that length of stay, faster discharges, patient satisfaction and staff satisfaction could be positively impacted by adding an ACNP. However, these responses did not occur with the same frequency as "accessibility."

Dissatisfaction with the Current Care Model

The only question that drew consistent responses from all analyzed cohort groups addressed concerns with the efficiency of the current care model. The total group mean was 6.68, the physician's mean score was 6.14, and the RN mean was 6.82. The standard deviation for all groups was less than 1, indicating little variability. Therefore, while the cohort groups may not agree on the change, it is a consensus that change is needed to make the model more efficient.

Aside from the proposed intervention of adding ACNPs, no other changes were suggested in this project.

Efficacy of the Executive Summary

The executive summary was perceived to be helpful by the registered nurses in addressing how the proposed change might affect the work environment, with an average response of 6.2. The physicians' average response was 4.6 indicating the executive summary was of questionable use in providing information on how their role and work environment might be affected by the change. The total responses indicated a mean of 6.00 with a SD of 1.29. It is unknown how many of the project participants read the executive summary prior to answering the question. There were four missing total responses, which was the most for any question. This could indicate that respondents chose not to answer if they had not read the summary.

Limitations and Potential Confounding Factors

The data collection tool for this project, while based on other validated TTM instruments, was not itself validated nor is there a specific formula to determine the TTM from the survey. The PI utilized scoring strategies from other TTM surveys where larger means indicated a more advanced stage. However, the use of the Decisional balance weight in this project was an additional component for consideration. Overall, the survey return rate was less than 50%, which limits the ability to generalize findings to the full cohort groups. There was also a large discrepancy between the number of registered nurse surveys returned and the number of physician surveys returned, which should be considered when analyzing the total responses.

It should be noted that the primary investigator was known to most physicians approached from her prior role as an intensive-care nurse in BDMC. The prior professional

acquaintance might have increased the response rate from the physician group. It was not a possibility to address multiple physicians in a single setting as there was when dispersing the surveys to registered nurses in the huddle setting. The resulting need for individual approaches increased the variability of each encounter, and it should be considered that these variations might have affected response rates and possibly the responses themselves, despite the anonymity of the survey results.

A further consideration is that the registered nurses and nurse manager received an email from the director about a month prior to data collection as an introduction to the project. It is possible that this preliminary email may have influenced participation from the registered nurse/nurse manager cohorts or allowed them more time for pre-contemplation of the proposed intervention, potentially moving this group further along the Stages of Change continuum.

Comparison of Findings with Literature

Prior literature review did not reveal the use of a prospective survey of staff prior to adding NPs to a service line. However, many of the perceptions and feelings of BDMC staff were consistent with previous findings in literature. Similar to a multidisciplinary comparative study examining the contributions of ACNPs to an ICU, accessibility is perceived to be an advantage to having an ACNP on the care team (Hoffman et al., 2004). The need for an accessible provider is mentioned in several comments both by RNs as well as one physician. Pros such as “more face time to patients,” “availability on unit,” “quicker response for orders,” “timely orders,” “easier to get orders,” “easier access” related to the concept of accessibility (Appendix J). Furthermore, 15 of the 35 total pros addressed the issue of needing an accessible provider on the unit and the belief that adding an ACNP could fill that need.

The perception that physician buy-in is a barrier to adding ACNPs to care delivery models was demonstrated to an extent in this project's findings (McGee & Kaplan, 2007). Of the 11 cons listed by participants, eight were brought forth by physicians. Furthermore, the cons brought forth by physicians addressed concern for malpractice issues, increased liability, missed diagnoses, or the unsuitability of ACNPs in internal medicine. These concerns have not been supported by available literature. Multiple studies have demonstrated comparable health status scores, mortality, and complications between physicians and advanced practice providers (PA, NP, ENP) suggesting that non-physician providers can provide safe and effective care to observation patients (Dinh et al., 2012; Newhouse et al., 2011; Morris et al., 2012; Sherwood et al., 2011).

Implications for Banner Desert Medical Center

Stage-Matched Interventions for Registered Nurses

Based on the findings of this project, the registered nurse cohort is advanced in the Contemplation stage and most likely already in the Preparation stage. Thus, the group would be ready to move forward with a trial of adding ACNPs to the care delivery model within 30 days. The TTM identifies the primary Process of Change associated with this stage as "self-liberation," which is the belief that a change can succeed and making a firm commitment to the proposed change (Proschaska et al., 2001). An appropriate stage-matched intervention for registered nurses would be the development of change teams, so this group could work with others to prepare for the change (Clark, 2013). Inclusion of nurses on a multidisciplinary team that will include leadership, physicians, representatives from other areas of management would be appropriate.

Stage-Matched Interventions for Physicians

Staff in Precontemplation and Contemplation stages can be resistant to change and likely to see the change as imposed if they are required to act before they are prepared (Proschaska et al., 2001). According to Proschaska et al., (2001), the strongest reason staff in the Precontemplation State are resistant to a proposed change is that from their perspective, the benefits are not strong enough. To progress from Precontemplation to Action on this initiative, there must be a 1 standard deviation increase in the pros of making a change, and a 0.5 standard deviation decrease in the cons (Prochaska, Redding, Harlow, Rossi, & Velicer, 1994). Physician cohorts could be periodically assessed to determine if the Decisional Balance has changed. A larger sample of physician perspectives and concerns is also advisable.

Respecting the Stage of Change in which the cohort resides and communicating the importance of the cohort perspectives are sensitive and effective methods to manage resistance to a change initiative (Proschaska et al., 2001). An appropriate stage-matched intervention for physicians would be to facilitate consciousness-raising activities such as communicating information about the proposed change and the consequences of failure to change (Proschaska et al., 2001). These communications can take the form of memos, newsletters, or other informational sessions (Levesque et al., 2001). An open forum or meeting would be helpful to explore concerns and questions regarding the intervention. Physician responses on the survey indicated that their collective knowledge about ACNPs and their effect on care was moderate on average, but again as a group they demonstrated wider variability than the RNs. Thus, increasing physician knowledge about current research of ACNP contributions and potential impact on practice would be helpful. The insight gained from the pros/cons identified in the survey could

direct future interventions for BDMC as areas to enhance knowledge. The physicians also need to be encouraged to express their feelings and fears about this change such as changing roles or the fear that NPs might replace their positions. Exploring these feelings and increasing knowledge would allow physicians to re-evaluate what this change would mean for their practice and to see if implications of the change might lead to success of the unit without threatening their sense of identity (Proschaska et al., 2001) (Clark, 2013). This will help the physicians advance to the Contemplation and then the Preparation stage.

Opinion Leaders and Change Champions

The larger SD amongst physician responses indicates variability among physician perspectives. The role of the change champions, or early adopters, in the initial stages of change mobilization cannot be overstated as these individuals have high inherent motivation and can work to develop working relationships with others and develop "social capital" (Clark, 2013). Senior nursing leadership can introduce change and innovation; however, they are probably viewed to be external to physician professional and socials systems, which is a barrier. There are not enough similarities to the physicians for senior nursing leadership to be functional as opinion leaders (Lundblad, 2003)). Per Rogers' diffusion of innovation theory, the diffusion of change is ultimately a social process (Lundblad, 2003). The relationship between the person communicating the innovation and the potential adopter is critical to the rate of the adoption (Lundblad, 2003). Effective communication between the innovation leaders and the other potential adopters is more likely to occur when there is a recognized similarity, which in this case is a physician with similar training and job responsibilities (Lundblad, 2003). With regards to the rate of adoption, the potential adopter's confidence in the opinion of the source of the

communication is found to be more influential than the qualities of the innovation itself (Lundblad, 2003). Within the physician responses, some respondents answered very strongly on the questionnaire and are more advanced along the stages of change continuum than other colleagues. Moving forward, identification of these individuals is crucial as they are potential opinion leaders for change. Rogers' diffusion of innovation theory also supports this social influence to be the force that diffuses the innovation throughout the cohort (Prochaska et al., 1994).

PEPPA Framework

The implementation of any structural change such as adding a new team role or changing a care model is challenging for a facility. The PEPPA framework is a guide to introduce and evaluate advanced practice nurse (APN) roles that could assist BDMC in developing and implementing a new care model (Bryant-Lukosius & DiCenso, 2004). The framework involves a series of nine steps: 1) define the patient population and describe current care model; 2) identify stakeholders and recruit participants; 3) determine need for a new model of care; 4) identify priority problems and goals; 5) define new model of care and APN role; 6) plan implementation strategies; 7) initiate plan; 8) evaluate APN role and new model of care; and, 9) long term monitoring of the APN role and model of care (Bryant-Lukosius & DiCenso, 2004).

The facility has already defined the patient population and care model. Some participants and stakeholders have been identified (e.g., physicians, nurse managers, registered nurses), however a more diverse team of stakeholders should be assembled including billing representatives, administration, risk assessment, etc. In recognizing the need to decrease LOS, BDMC has identified at least one priority problem and goal of the unit. However, before

developing a new care model that includes ACNPs, additional priority patient needs should be identified by the input of stakeholders and a consensus decision should be reached on these goals (Bryant-Lukosius & DiCenso, 2004). These priorities and goals will provide the basis for outcomes to evaluate the new model of care and the ACNP role (Bryant-Lukosius & DiCenso, 2004). After these priorities are decided, the facility can explore defining a new model of care and the role of an ACNP in that unit. When exploring this new model, it will be important to clarify the various stakeholder perceptions of the ACNP role in clinical practice, research, and education to avoid role confusion (Bryant-Lukosius & DiCenso, 2004).

CAS and Care Model Considerations

If BDMC observation unit leadership intends to add ACNPs to the care delivery model, it will also be important to be mindful of CAS theory and the importance of respecting local contexts. While the introduction of ACNPs into observation units in other Banner facilities has been accepted, CAS theory reminds potential change innovators that to be successful, the design of any new intervention or practice changes must consider existing local conditions and dynamics (Litaker, Tomolo, Liberatore, Stange, & Aron, 2006). The inherent complexities of introducing a change within a diverse organization must be respected, and interactions and interventions are rarely linear and frequently unpredictable (Litaker et al., 2006). If the decision is made to move forward with a trial of ACNPs, the development of the exact care delivery model will need to be explored with care to meet the needs of both physicians and of registered nurses. The pros identified by registered nurses indicate that having an accessible provider is of upmost importance. Not all care models utilize an NP as a dedicated provider for the unit. For example, some hospitals in the Banner systems are using observation ACNPs primarily as

admitters, it appears this care delivery model may not meet the identified needs of the RNs. The physician Decisional Balance expressed concerns for missed diagnoses and liabilities, though these apprehensions have not been validated by the research. Given the unique concerns of the cohort groups, if a time does come to advance to a trial of an ACNP, a multidisciplinary planning team consisting of ACNPs, physicians, and RN would be advisable. A further analysis of the pros/cons identified by staff would be meaningful to BDMC if they choose to move forward with ACNPs to assist in further determining the direction of future planning and education focus.

Again, the development of a multidisciplinary team will be necessary to determine the model of care that will best suit the local conditions of BDMC. By using the pros/cons provided by staff as a guide, this team would hopefully be able to determine the care model that would best suit the diverse needs of staff, physicians, leadership, and patients. BDMC will need to further explore the views and concerns of physicians about adding ACNPs to the care model and address these concerns. Alternatively, despite the findings of this project, BDMC could decide to explore alternative interventions to reduce LOS. These might include having an on-unit physician provider or exploring the development of a protocol driven unit (Ross et al., 2013).

CONCLUSIONS

Following the Model for Improvement, the aim of the BDMC observation unit is to decrease average LOS. There is sufficient evidence in the literature to support a trial of adding ACNPs to the care model to achieve this aim. The goal of this project was to determine staff support for the proposed change with the purpose of providing guidance for the future direction of the BDMC quality improvement interventions. The conclusion of this project is that a trial of adding ACNPs to the care delivery model in the BDMC observation unit to decrease LOS would

be accepted by the registered nurses in the unit. However, further interventions such as memos, open meetings, educational forums, and the support of physician opinion leaders will be needed to gain more widespread support from the physician group prior to proceeding. Utilizing the PEPPA framework would provide a guide to assist BDMC in developing and implementing a new care model utilizing ACNPs. If a trial is attempted, ACNP role clarification and careful monitoring of desired metrics such as LOS, cost, staff and patient satisfaction will be essential to determine success of the intervention.

The lack of uniformity of ACNP roles, even within the Banner Health system, makes it challenging to compare outcomes such as LOS, patient satisfaction, staff satisfaction and cost reduction across clinical settings. ACNP various care delivery models in observation units should be evaluated throughout Banner Health on these outcomes to determine if future integration of ACNPs into observation is economical and effective. More broadly, further research is also needed nationally to explore the efficacy, safety, and unique contributions of ACNPs in observation.

APPENDIX A:

EVIDENCE APPRAISAL TABLE

Author/Article	Qual: Concepts or phenomena Quan: Key variables Hypothesis, research questions	Theoretical framework	Design	Sample (N)	Data Collection (Instruments/ Tools	Findings
Sherwood et. al EDOU staffing by PAs	1) Understand number of patients, medical complexity and risk factors. 2) Describe operation of EDOU and what kind of patients were under care of PAs. 3) Determine if numbers of patients and their medical complexity could be safely evaluated in EDOU by PAs.	None identified	-Retrospective Chart review; descriptive analysis; Measures: patient characteristics LOS, admission rates, adverse events (deaths, intubations, loss of VS, missed injuries in 30 day followup)	April 2006-May 2007: 2297 pts during study period 524 chest pain from patient; 364 trauma patient admitted to EDOU	Chart review performed by trained medical students; predefined criteria and definitions. patients identified for EDOU by hospital billing charges; follow up by principal investigators	-most patients cared for in EDOU by PAs = chest pain and trauma - initial orders and placement in EDOU by physicians -the patients care for by PAs were medically complex -admission rates within accepted rate of less than 15% - no significant adverse events in patients care for by PAs *EDOU directors may want to consider adding PAs to staffing model
Ross et al. Protocol Driver EDOUs offer savings, shorter stays, reduced admissions	Key Variable: Types of Observation Services 1) Protocol driven observation units; 2) discretionary care observation unit; 3) protocol driven, bed in any location; 4) discretionary care, bed in any location Research Question: Examine the impact of Protocol driven observation units (Type 1) on length of stay and cost. Compared to other types of observation management -Impact of observation units on avoidable admissions	None identified	Retrospective observational cohort study Compared 1) prototype type 1 units in Atlanta, GA with performance of representative sample of 2) US hospitals) and 3) all hospitals in Georgia (all 4 types) -	Data from 2009-2010 -7,199 observation visits in Emory Hospital -101,593 observation visits in GA -1,392,000 visits in US.	-Used case study approach, since no standardized way to identify type 1 units based on national data. -Utilized CPT codes, revenue codes, observation stay charge, to identify observation stays.	-patient conditions seen similar across all three study groups -fewer than 0.1% of patients in Type 1 units had stays longer than 48 hours compared to 7.2% of all GA, and 6.9% of patients in US. -estimated that use of type 1 units patient in would lead to 28% reduction in LOS nationally, leading to savings $950 million nationally

Collins et. al Outcome of adding acute care nurse practitioners to a Level 1 trauma service with the goal of decreased length of stay and improved physician and nursing satisfaction.	Hypothesis: experienced ACNPs on stepdown unit would improve throughput and decrease LOS and hospital charges, and improve staff satisfaction. Variables: LOS, Injury Severity Score (ISS), patient costs Staff Satisfaction metrics = NPs knowledgeable about plan of care; patient care, families informed of care plan; throughput; workflow	None identified	-Single center retrospective report Vanderbilt University Medical Center added ACNPs to stepdown area 5 days a week from December 2011-December 2012.	-5 ACNPs - service line 15-25 patients daily - 22 nurses and 13 attending trauma surgeons -1667 patients for LOS data	-Nurses and attending physician surveys (Likert scale) -Discharge data collected from institutions Medipac software and compared to previous trauma patients over the last 2 years. -Case mix index (CMI) for billing data	-76.9% physicians strongly agreed NPs helped workflow, 83% strongly agreed overall improved patient care; 100% strongly agreed improved throughput -100% of dayshift RNs strongly agreed that NPs knowledgeable about patient POC, improved patient care, pain better controlled; 96% strongly agreed families better informed about POC -decrease in ALOS for entire service (ICU, stepdown, and floor) by 0.55 days with resulting reduction of $8,878,000 in hospital charges over 6 months -discharges by NPs from stepdown increased by 21% from physician discharges.
McGee et al.	Qualitative: Determine factors that influence the decision to use NPs in the emergency department	None identified	Qualitative exploratory study -convenience sample of ED managers in SW Washington that do and do not employ NPs	4 ED Manager	-interviews at place of employment -semi-structured interview -tape recorded and transcribed verbatim -transcripts analyzed using content analysis -voluntary data sharing from ED	- level of non-emergent visits 25-40% -all reported that overcrowding is a problem -all hospitals contracted with outside ED physicians and the decision to employ NPs ultimately up to physicians. -reasons NPs not employed

					managers for % of ED visits that were primary care problems or non-life threatening problems	not known to managers. Speculation that "getting past medical model of physicians" major reasons -concerns from physicians regarding liability issues of NPs despite independent practice. -2 of 4 EDs had NPs in non-emergent area of ED. -no studies that explored physician perspective on hiring NPs in ED
Dinh et. al, 2012	- Study quality of care delivered by ED fast track unit where both physicians and ENP treated. -Hypothesis: ENP associated with higher patient satisfaction compared to physicians - Quality of care measured by adverse event rate (missed fractures or unplanned representations- visits to ED in 14 days), follow up health status, and patient satisfaction.	None identified	Study design: Observational Study using convenience sample of ED patients -descriptive statistics ues for analysis (linear regression model, $p < 0.05$)	-320 patients between 16 and 70 enrolled out of 800 identified, 236 completed surveys	- Care of patients randomized to physician or ENP -self administered pt validated satisfaction survey -Short form 12 health survey for health status -electronic pt tracking system and self report for adverse events	-84% of patients rated care as "good" or "excellent" -8% of patients had missed fractures or unplanned representations -trend to shorter waiting time in ENP group -total satisfaction higher in ENP group - 6% of Dr. group and 9% of ENP group had unplanned representations and 1 missed fracture in each group
Medeiros et. al.	-Systematic review to evaluate midlevel practitioner practice on intensive care unit outcomes -Outcomes: patient satisfaction, length of stay, mortality, and resource utilization and cost -Midlevel providers: NP, PA, CNS	None identified	Systematic Review of Medline and CINAHL databases from 1982-2007 -Inclusion criteria: database articles, midlevel provider, ICU outcomes, adult critical care -Exclusion criteria: pediatric population, primary care focus,		Database key search words for Medline: LOS, PA, NP, CNS, ICU, critical care, patient satisfaction, mortality, hospital resources Search words for CINAHL: Midlevel provider, ICU, critical care,	-all studies similar in design (Convenience sampling during set time frame, use of descriptive statistics for analysis) - ICU LOS most common outcome - Decreased LOS and costs with addition of midlevel providers, however, overall level of evidence low (Levels III and IV out of

			emergency/fast track focus		LOS, patient satisfaction, mortality, hospital resources -Code sheet used to organize findings (study, purpose, design, sample, setting, variables, methods, conclusion, level of evidence	VI)
Kapu et al.	-Examine financial impact of adding NPs to inpatient care teams at Vanderbilt University Hospital -Outcomes examined: billing, acuity, length of stay, NP-associated quality metrics	None identified	-Retrospective secondary analysis of return on investment - review of billing revenue, cost savings associated with decreased LOS and cost avoidance as associated with practice specific quality outcomes.	-5 inpatient NP teams (3 critical care consult teams (CVICU,NCU, SICU) and 3 units based primary teams (MICU and trauma step down)	-Trauma NP team: admission, discharge, and transfer data, chart abstraction and billing -MICU NP team: existing quality data templates, billing review -	-NPs added revenue via gross collections as billing providers -NP model of care cost effective when considered relative salary to physicians, even when considering 85% reimbursement rate -LOS and risk-adjusted LOS for all NP teams lower than before NPs added - $28 million saved in hospital charges due to reduced LOS -quality measures improved after NP addition except for DVT prophylaxis in NCU -Cost advantages to hiring NPs are significant through cost saving and cost avoidance

Newhouse et al.	Study Question: Compared to other providers (physicians or teams without APRNs) are APRN patient outcomes of care similar?	None identified	Systematic review of PubMed, CINAHL, and Proquest. -Inclusion criteria: Studies 1990-2008; RCT or observational study of at least two groups of providers APRN working alone or in team compared to teams without APRN -Exclusion criteria: non-English, outside U.S. studies; non-quantitative data	-107 included studies (49 for NPs; 22 CNS; 23 CNM; 4 CRNA) - 69 studies (20 RCTs and 49 observational) included in outcome aggregation -37 final studies for NPs (14 RCTS and 23 observational)	- Search terms developed for each APRN subgroup; terms not specified, but "broad". -Data abstraction by two reviewers - Quality assessment using Jadad scale; comparability using other quality criteria (sample size, reliability & validity of measures, etc) -outcomes aggregated when there were a minimum of three studies with the same outcome. -Aggregated outcomes graded according to GRADE criteria	-NP findings: High level evidence supporting equivalent outcomes for: 1) pt satisfaction 2) self-reported perceived health 3) Functional status outcomes 4)Glucose control 5)Hospitalization rates 6) Mortality Improved outcomes: 1) Lipid levels Moderate evidence to support: 1) Equivalent LOS Low level evidence: 1) Duration of mechanical ventilation
Morris et al.	Research Question: Determine if there are differences between the care provided by unit based nurse practitioners (UBNP) and medical resident run (RR) for trauma patients. UNBP model description: all patients from trauma admitted to this unit (unless full, then admitted to other RR units); 2 UBNP present at all times, supervised by attending trauma surgeon.	Unit run by designated NPs as a model for improving care outcomes.	Retrospective analysis. -Data collected from 1/1/2007 – 8/31/2010 (when UBNP model implemented)	-4,152 trauma patients during study period; 196 deaths after admission, excluded from comparison; 97 discharged from ICU also excluded. -3,859 patients remaining included -mean age 42.5, 71% were male -71.5% of patients admitted to UBNP unit.	Demographic data, mechanism of injury, Injury Severity Score; and Abbreviated Injury Scale -Cross referenced with hospital database to ID comorbidities on admission, occurrence of complications (standardized definitions by AHRQ) -Descriptive statistics, categorical variables were compared using Fisher's exact; continuous variables with T-tests.	-characteristics of groups were similar for comparison -no significant differences in mortality, ISS, complication of pulmonary emboli, acute renal failure, or surgical site infection. -Increased incidence of DVTs on UBNP units (though both within range of published studies). -significantly more patients discharged to home in UBNP -Decreased LOS in UBNP,

					- $p < 0.05$	though not statistically significant, but results in 1,300 fewer days overall which is clinically important.
Hoffman et al.	Qualitative Phenomena: Examine perspectives of medicine, respiratory care, and nursing of acute care NP contributions in 2 intensive care units	Continuous quality improvement	Comparative Survey- open ended	Setting: 2 ICUs in adult teaching hospitals Participants: -9 attending physicians (69%) -15 respiratory therapists (26%) -29 staff nurses (26%)	-open ended survey given via hospital mail, direct approach, or the internet. list 3 advantages and 3 disadvantages of collaborative care provided by ACNPs. -Data Analysis: coding and constant comparative analysis	Themes: 1)**Accessibility** -enhanced for pts, families, providers -disadvantage only working day schedule 2) **Competence /Knowledge** -less knowledgeable than intensivists and less competent in emergencies -more competent in providing routine care than physicians -more interested in pt outcomes than physicians 3) **Care coordination/ communication** -commitment to care quality for chronically critically ill patients -excellent teachers for staff -increased efficiency - better communication with staff and families, though physicians have greater weight/credibility with families -holistic focus -role confusion with RNs (perceived as micromanaging nurses at times) 4) **System Issues** -hospital policy requires cosignature by physician,

						viewed as disadvantage -burnout By Discipline: -MD: continuity of care, pt/family focus; commitment -RT: accessibility and quality outcomes -RN: accessibility, commitment; pt and family focus

APPENDIX B:

POST-PROJECT LITERATURE REVIEW

Title	Authors	Design	Findings
Evaluation of the implementation of ANP roles in an acute care setting	McDonnell, Goodwin, Kennedy, Hawley, Gerrish & Smith	Collective case study	1) ANPs had a positive impact on patient experience, outcomes and safety 2) Improved staff knowledge, skills, competence, distributed workload 3) Contributed to achieving organizational priorities and development of policy
Emergency NP model of care in an Australian ED	Jennings, Gardner, O'Reilly, Mitra	Randomized controlled trial	Between standard ED care and NP care there, no significant differences in waiting times, LOS, numbers of pts who left AMA, pt representations w/in 48 hours, use of EBG
Diagnostic accuracy of ENP vs physicians related to minor illnesses and injuries	Van der Linden, Reijnen, de Vos	Descriptive cohort study	ENPs showed high diagnostic accuracy. No significant differences between NPs and physicians related to missed injuries and inappropriate management
Impact of NP services on cost, quality of care, satisfaction and waiting times in the ED: A systematic review	Jennings, Clifford, Fox, O'Connell, Gardner	Systematic review	1) NPs service have a positive impact on quality of care, patient satisfaction and waiting times 2) Insufficient evidence to draw conclusions regarding outcomes of a cost benefit analysis

APPENDIX C:

EXECUTIVE SUMMARY

The Problem:

- All Banner facilities share the goal of keeping average length of stay (LOS) for observation patients to less than 24 hours.
- Banner Desert Medical Center (BDMC) is currently attempting to decrease the average observation LOS from 28.8 hours to a target of 23.97 which is a 7% reduction (1)
- One study found $28 million saved in hospital charges due to reduced LOS (4)

Hypothetical Intervention:

- Add acute care nurse practitioners (ACNPs) to work collaboratively with hospitalist physicians in the BDMC observation units.

Rationale:

- Several Banner Health hospitals including Boswell, Del Webb, and Casa Grande are staffing observation units with dedicated ACNPs to work collaboratively with physicians to meet unit goals.
- The multidisciplinary structure of observation units as well as the need for an understanding of hospital organizational flow are well suited to the skills and model of care utilized by ACNPs.
- The presence of an ACNP on a unit has the potential to enhance continuity of care and patient outcomes through increased provider accessibility, commitment to quality of care, and strong communication with staff and families (3).

Supporting Evidence:

- A Vanderbilt retrospective analysis found that LOS and risk-adjusted LOS were lower for NP teams than for teams that did not have NPs (4).
- An observation study examining quality of care outcomes in an ED fast track unit demonstrated that follow up health status scores were comparable between emergency nurse practitioner (ENP) and physician groups, as were adverse events (5).
- Strong communication skills, comprehensive care coordination, and continuity were perceived as advantages ACNPs brought to the ICU collaborative model (3).
- A single center retrospective analysis found that 76.9% of physicians strongly agreed that NPs helped improve work flow when added to a Level 1 Trauma service, 83% strongly agreed that overall patient care was improved, and 100% agreed that throughput was improved (2).
- The above study also reported a decrease in ALOS for entire service (ICU, stepdown, and floor) by 0.55 days with resulting reduction of $8,878,000 in hospital charges over 6 months (2)
- NP model of care is cost effective when considered relative to salary of physicians, even when considering 85% reimbursement rate (4)

Goals of Survey:

- Determine the degree of staff support for this hypothetical intervention.
- Identify potential pros and cons of this proposal in the view of staff members.

References

(1) LaFleur, M., & Tong, C. (2016, February). *2016 CRI: Observation LOS*. Paper presented at the Banner Desert Medical Center, Mesa, AZ.

(2) Collins, N., Miller, R., Kapu, A., Martin, R., Morton, M., Forrester, M., ... Wilkinson, L. (2014). Outcomes of adding acute care nurse practitioners to a Level 1 trauma service with the goal of decreased length of stay and improved physician and nursing satisfaction. *Journal of Trauma and Acute Care Surgery, 76*(2), 353-357. http://dx.doi.org/10.1097/TA.0000000000000097

(3) Hoffman, L. A., Happ, M. B., Scharfenberg, C., Divirgilio-Thomas, D., & Tasota, F. J. (2004). Perceptions of physicians, nurses, and respiratory therapists about the role of acute care nurse practitioners. *American Journal of Critical Care, 13*(6), 480-488. Retrieved from www.ajcc.aacnjournals.org

(4) Kapu, A., Kleinpell, R., & Pilon, B. (2014). Quality and financial impact of adding nurse practitioners to inpatient care teams. *Journal of Nursing Administration, 44*(2), 87-96. http://dx.doi.org/10.1097/NNA.0000000000000031

(5) Dinh, M., Walker, A., Parameswaran, A., & Enright, N. (2012). Evaluating the quality of care delivered by an emergency department fast tract unith with both nurse practitioners and doctors. *Australian Emergency Nursing Journal, 15*, 188-194. http://dx.doi.org/10.1016/j.aenj.2012.09.001

APPENDIX D:

DATA COLLECTION TOOL

Disclosure

This survey is part of a doctorate of nursing practice (DNP) student project exploring staff perspectives on the addition of acute care nurse practitioners to observation units at Banner Desert Medical Center. The proposed intervention is part of an academic project, and is not under active consideration by leadership. Completion of this survey and participation in this project is voluntary. If you complete the survey, you are confirming that you voluntarily consent to participate in this project and you understand that participation in the project is not a condition of employment at Banner Health. You may complete this survey at work. If you elect to complete the survey on your own time, you will not be paid for your time spent on completing the survey.

****

My primary role is the observation unit is: (Please circle one response)

Registered Nurse Physician Leadership/Management Position

Please circle one response for each question using the following scale.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

1) I am open to working with acute care nurse practitioners (ACNP) in the observation units.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

2) I believe that our current observation unit model of care could be more efficient.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

3) I think that adding ACNPs to the current model of care would make my job easier.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

4) I am excited about the possibility of adding an ACNP to the observation care team.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

5) I've heard or read about ACNPs and their impact on hospital length of stay and patient care.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

6) I think having an ACNP would decrease the length of stay in the observation unit.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

7) I worry that adding ACNPs to work collaboratively with physicians might have a negative impact on patient care.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

8) The information provided in the executive summary gave me valuable information about how adding ACNPs to the care team could affect me and my work environment.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

9) I feel I would be ready to explore adding ACNPs to the care delivery model within the next six months.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

10) I feel that I need more information before deciding if I would support adding ACNPs to the care team in the observation units.

Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

11) Please briefly write any pros and cons you identify about adding ACNPs to the observation unit care team.

Pros	Cons

APPENDIX E:

THE UNIVERSITY OF ARIZONA IRB APPROVAL LETTER

Research
Office for Research & Discovery

Human Subjects
Protection Program

1618 E. Helen St.
P.O Box 245137
Tucson, AZ 85724-5137
Tel: (520) 626-6721
http://rgw.arizona.edu/compliance/home

Date:	October 17, 2016
Principal Investigator:	Kacey Lohmann
Protocol Number:	1610925166
Protocol Title:	Proposed Addition of Acute Care Nurse Practitioners in Observation Units: Identifying the Stage of Change of Staff Cohorts at Banner Desert Medical Center
Determination:	Human Subjects Review not Required

The project listed above does not require oversight by the University of Arizona because the project does not meet the definition of 'research' and/or 'human subject'.

- **Not Research as defined by 45 CFR 46.102(d):** As presented, the activities described above do not meet the definition of research as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "research means a systematic investigation, including research development, testing and evaluation, designed to contribute to generalizable knowledge".
- **Not Human Subjects Research as defined by 45 CFR 46.102(f):** As presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention ***or*** interaction with the individual, or identifiable private information".

Note: Modifications to projects not requiring human subjects review that change the nature of the project should be submitted to the Human Subjects Protection Program (HSPP) for a new determination (e.g. addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the research question). Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX F:

BANNER DESERT MEDICAL CENTER RESEARCH APPROVAL

Date: November 16, 2016

To: Kacey Lohmann, DNP Student

As the Chair of the Banner Desert/Cardon Children's Nursing Research and EBP Committee, I am pleased to inform you that your project: "Proposed Addition of Acute Care Nurse Practitioners in Observation Units: Identifying the Stage of Change of Staff Cohorts at Banner Desert Medical Center" has been approved by the Committee.

We support your work and appreciate your contribution to excellent patient care! Our committee remains available to you if you need any additional guidance with your project.

Congratulations,

Shelly Fleiner

Shelly Fleiner DNP RNC-NIC CCNS
Chair, Nursing Research and EBP Committee
Banner Desert/Cardon Children's Campus
Banner Health

APPENDIX G:

OBSERVATION STAFF EMAIL

Hello,

We have a nurse practitioner student Kate Lohmann who will be doing her DNP project here on our unit. She is collecting information for her project via a survey that she will be handing out January 5-7. 10-12, and 16, 17, 20 if needed to catch remaining staff. Please know that this is a research project for her DNP project and we will not be hiring nurse practitioners at this time in observation. See information below on what Kate's project entails.

My DNP project in summary: The observation units at Banner Desert Medical Center are trying to reduce the average length of stay for a patient. While there is not much research exploring the effect of nurse practitioners in observation units in particular, there is other research that shows that the addition of nurse practitioners to various inpatient teams has had a positive effect on reducing the length of stay for patients, as well as other outcomes such as patient and staff satisfaction. I am interested in exploring whether or not the nurses, managers, and physicians that cover the observation unit here at Desert would be open to adding acute care nurse practitioners to the care team as a hypothetical intervention to reduce the average length of stay for a patient. I will be handing out an executive summary detailing some supporting evidence for this idea, and also a 11 question survey exploring your thoughts about this hypothetical solution. I know you are very busy, but if you have the time to fill it out and return it (anonymously) I would value your thoughts! I will be on unit during huddles about three days a week for three weeks to hand them out and I hope to catch most of you at some point during that time.

If you have any questions prior to Kate's arrival next week please contact me.

APPENDIX H:

TOTAL RESPONSES

	1) Open to working with ACNPs in the observation unit	**2) Our current model of care could be more efficient**	**3) Adding ACNPs will make my job easier**	**4) Excited about the possibility of adding ACNPs**	**5) Recall information I've heard or read about ACNPs**
N: Valid	30	31	30	31	31
Missing	1	0	1	0	0
Mean	6.33	6.68	6.00	6.03	5.68
Median	7.00	7.00	7.00	7.00	6.00
Mode	7	7	7	7	7
SD	1.398	.541	1.702	1.760	1.720
Minimum	2	5	1	1	1
Maximum	7	7	7	7	7
	6) Having an ACNP might decrease the LOS	**7) Worry adding ACNPs might have a negative impact on patient care**	**8) Executive summary helped me understand how this change could affect my work environment**	**9) Ready to try a pilot test of adding ACNPs within the next six months**	**10) Need more info before deciding whether I support adding ACNPs**
N: Valid	31	30	27	30	28
Missing	0	1	4	1	3
Mean	5.74	2.03	6.00	5.93	3.14
Median	6.00	2.00	6.00	6.5	2.00
Mode	7	1	7	7	1
SD	1.653	1.299	1.144	1.507	2.085
Minimum	2	1	4	2	1
Maximum	7	6	7	7	7

APPENDIX I:

RESPONSES BY PRIMARY ROLE

Primary Role		1) Open to working with ACNPs in the observation unit	2) Our current model of care could be more efficient	3) Adding ACNPs will make my job easier
Registered Nurse	N: Valid	17	17	16
	Missing	0	0	1
	Mean	6.82	6.82	6.81
	Median	7.00	7.00	7.00
	Mode	7	7	7
	SD	.393	.393	.403
	Minimum	6	6	6
	Maximum	7	7	7
Physician	N: Valid	6	7	7
	Missing	1	0	0
	Mean	4.17	6.14	3.71
	Median	3.5	6.00	3.00
	Mode	3	6	3
	SD	1.941	.690	2.059
	Minimum	2	5	2
	Maximum	7	7	7
		4) Excited about the possibility of adding ACNPs	**5) Recall information I've heard or read about ACNPs**	**6) Having an ACNP might decrease the LOS**
Registered Nurse	N: Valid	17	17	17
	Missing	0	0	0
	Mean	6.82	6.12	6.47
	Median	7.00	6.00	7.00
	Mode	7	7	7
	SD	.393	1.317	.800
	Minimum	6	2	4
	Maximum	7	7	7
Physician	N: Valid	7	7	7
	Missing	0	0	0
	Mean	3.43	4.14	4.29
	Median	3.00	5.00	4.00
	Mode	1, 3	1, 5	2, 4
	SD	2.149	2.340	1.890
	Minimum	1	1	2
	Maximum	7	7	7

		7) Worry adding ACNPs might have a negative impact on patient care	8) Executive summary helped me understand how this change could affect my work environment	9) Ready to try a pilot test of adding ACNPs within the next six months
Registered Nurse	N: Valid	16	15	16
	Missing	1	2	1
	Mean	1.81	6.20	6.56
	Median	1.00	6.00	7.00
	Mode	1	6	7
	SD	1.047	.862	.512
	Minimum	1	4	6
	Maximum	4	7	7
Physician	N: Valid	7	5	7
	Missing	0	2	0
	Mean	3.14	4.60	3.86
	Median	3.00	4.00	4.00
	Mode	2, 3	4	4
	SD	1.773	1.342	1.733
	Minimum	1	4	2
	Maximum	6	7	7
		10) Need more info before deciding whether I support adding ACNPs		
Registered Nurse	N: Valid	14		
	Missing	3		
	Mean	2.64		
	Median	2.00		
	Mode	1		
	SD	1.692		
	Minimum	1		
	Maximum	6		
Physician	N: Valid	7		
	Missing	0		
	Mean	4.57		
	Median	5.00		
	Mode	7		
	SD	2.370		

APPENDIX J:

PROS AND CONS BY PRIMARY ROLE

Primary Role	Pros	Cons
Registered Nurse	If on unit, decreased time tracking down physicians	Less physician interaction
	More efficient with orders	if NPs not accessible to RNs faster than physicians than it's a waste of time
	Ability to order noncritical things	more people to get approval from
	Faster discharges	
	Easy accessibility	
	Immediate assessment	
	Decreased LOS	
	Average of 3 hours daily trying to reach physicians	
	d/c pts faster and easier	
	easier access to providers	
	Need ASAP	
	quicker D.C	
	Experienced NPs at Del Webb	
	Faster care	
	easier access to orders from physicians	
	on unit, don't have to wait for callback	
	Easy to get orders	
	pt satisfaction increase	
Unassigned or Manager	Need them now	Physician accomplished
	improved workflow	
	Timely orders	
	easier to obtain orders than waiting for hospitalists to return pages	
	NP better bedside manner	
	reduced los	
	pt satisfaction	
	available rounding	
	Additional support	
	It's awesome	
	improved communication	
	higher pt satisfaction	
	Decrease LOS	
	Need on floor at all times	
Physician	Availability on unit	Another team member
	Less pages	Cost added
	More "face" time to patients	Missed diagnoses
		Increased liability
		More ED dumps
		More pressure to d/c patients, increased utilization pressure
		internal medicine/hospitalist field is too broad for NP I find them to be valuable in subspecialties with narrow and define scope
		Malpractice issue

REFERENCES

American Association of Critical Care Nurses. (2012). *AACN scope and standards for acute care nurse practitioner practice*. Retrieved from http://www.aacn.org/wd/practice/docs/acnp-scope-and-standards.pdf

American College of Emergency Physicians. (2015). Observation care payments to hospitals FAQ. Retrieved from https://www.acep.org/Clinical---Practice-Management/Observation-Care-Payments-to-Hospitals-FAQ/

Banner Cardon Children's Medical Center. (n.d.). Banner Desert: Our partner in patient care. Retrieved from https://www.bannerhealth.com/Locations/Arizona/Cardon+Childrens+Medical+Center/About+Us/Banner+Desert+Partnership.htm

Bryant-Lukosius, D. & DiCenso, A. (2004). A framework for the introduction and evaluation of advanced practice nursing roles. *Journal of Advanced Nursing*, *48*(5), 530-540. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2648

Centers for Medicare and Medicaid Services. (2015). Medicare benefit policy manualchapter 6: Hospital services covered under part B. Retrieved March 2, 2016, from https://www.cms.gov/regulations-and-guidance/guidance/manuals/downloads/bp102c06.pdf

Centers for Medicare and Medicaid Services. (2015a). Fact sheet: Two-midnight Rule. Retrieved from https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2015-Fact-sheets-items/2015-07-01-2.html

Clark, P. G. (2013). Toward a transtheoretical model of interprofessional education: Stages, processes and forces supporting institutional change. *Journal of Interprofessional Care*, *27*, 43-49. Retrieved from http://dx.doi.org/10.3109/13561820.2012.730074

Collins, N., Miller, R., Kapu, A., Martin, R., Morton, M., Forrester, M., ... Wilkinson, L. (2014). Outcomes of adding acute care nurse practitioners to a Level 1 trauma service with the goal of decreased length of stay and improved physician and nursing satisfaction. *Journal of Trauma and Acute Care Surgery*, *76*(2), 353-357. Retrieved from http://dx.doi.org/10.1097/TA.0000000000000097

Dinh, M., Walker, A., Parameswaran, A., & Enright, N. (2012). Evaluating the quality of care delivered by an emergency department fast tract unith with both nurse practitioners and doctors. *Australian Emergency Nursing Journal*, *15*, 188-194. Retrieved from http://dx.doi.org/10.1016/j.aenj.2012.09.001

Dubree, M., Jones, P., Kapu, A., & Parmley, C. L. (2015). APRN practice: Challenges, empowerment, and outcomes. *Nurse Leader*, 43-49. Retrieved from http://dx.doi.org/10.1016/l.mnl.2015.01.007

Hoffman, L. A., Happ, M. B., Scharfenberg, C., Divirgilio-Thomas, D., & Tasota, F. J. (2004). Perceptions of physicians, nurses, and respiratory therapists about the role of acute care nurse practitioners. *American Journal of Critical Care, 13*(6), 480-488. Retrieved from www.ajcc.aacnjournals.org

Institute for Healthcare Improvement. (2016). Science of improvement: How to improve. Retrieved from http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementHowtoImprove.aspx

Jennings, N., Clifford, S., Fox, A. R., O'Connell, J., & Gardner, G. (2015). The impact of nurse practitioner services on cost, quality of care, satisfaction and waiting times in the emergency department: A systematic review. *International Journal of Nursing Studies, 52*, 421-435. Retrieved from http://dx.doi.org/10.1016/j.ijnurstu.2014.07.006

Jennings, N., Gardner, G., O'Reilly, G., & Mitra, B. (2015). Emergency NP model of care in an Australian emergency department. *The Journal for Nurse Practitioners*, *11*(8), 774-781. Retrieved from www.npjournal.org

Kapu, A., Kleinpell, R., & Pilon, B. (2014). Quality and financial impact of adding nurse practitioners to inpatient care teams. *Journal of Nursing Administration*, *44*(2), 87-96. Retrieved from http://dx.doi.org/10.1097/NNA.0000000000000031

LaFleur, M. & Tong, C. (2016, February). *2016 CRI: Observation LOS*. Paper presented at the Banner Desert Medical Center, Mesa, AZ.

Levesque, D. A., Prochaska, J. M., Prochaska, J. O., Dewart, S. R., Hamby, L. S., & Weeks, W. B. (2001). Organizational stages and processes of change for continuous quality improvement in health care. *Consulting Psychology Journal: Practice and Research*, *53*(3), 139-153. Retrieved from http://dx.doi.org/10.1037//1061-4087.53.3.139

Litaker, D., Tomolo, A., Liberatore, V., Stange, K., & Aron, D. (2006). Using complexity theory to build interventions that improve health care delivery in primary care. *Journal of General Internal Medicine*, *21*(), S30-S34. Retrieved from http://dx.doi.org/10.111/j.1525-1497.2006.00360.x

Lundblad, J. P. (2003). A review and critique of Rogers' diffusion of innovation theory as it applies to organizations. *Organization Development Journal*, *21*(4), 50-64.

McDonnell, A., Goodwin, E., Kennedy, F., Hawley, K., Gerrish, K., & Smith, C. (2014). An evaluation of the implementation of Advanced Nurse Practitioner (ANP) roles in an acute hospital setting. *Journal of Advanced Nursing*, *71*(4), 789-799. Retrieved from http://dx.doi.org/10.1111/jan.12558

McGee, L. A. & Kaplan, L. (2007). Factors influencing the decision to use nurse practitioners in the emergency department. *Journal of Emergency Nursing*, *33*(5), 441-446. Retrieved from http://dx.doi.org/10.1016/j.jen.2006.10.019

Medeiros, R. S., NeSmith, E. G., Heath, J. A., Hawkins, M. L., Hawkins, D., & Bias, R. (2011). Midlevel health providers impact on ICU length of stay, patient satisfaction, mortality, and resource utilization. *Journal of Trauma Nursing*, *18*(3), 149-152. Retrieved from http://dx.doi.org/10.1097/JTN.Ob013e31822b7faf

Medicare. (2014). Are you a hospital inpatient or outpatient? Retrieved from https://www.medicare.gov/Pubs/pdf/11435.pdf

Morris, D. S., Reilly, P., Rohrback, J., Telford, G., Kim, P., & Sims, C. A. (2012). The influence of unit-based nurse practitioners on hospital outcomes and readmission rates for patients with trauma. *Journal of Trauma and Acute Care Surgery*, *73*(2), 474-478. Retrieved from http://dx.doi.org/10.1097/TA.0b013e31825882bb

Napoli, D. A. (2014). Emergency department observation units offer efficiencies that cut costs, improve care. *Modern Healthcare*, *44*(44), 40. Retrieved from www.modernhealthcare.com

National Council of State Boards of Nursing. (n.d.). APRNs in the U.S. Retrieved from https://www.ncsbn.org/aprn.htm

Newhouse, R. P., Stanik-Hutt, J., White, K. M., Johantgen, M., Bass, E. B., Zangaro, G., . . . Weiner, J. P. (2011). Advanced practice nurse outcomes 1990-2008: a systematic review. *Nursing Economics, 29*(5), 230-250.

Plsek, P. E. & Greenhalgh, T. (2001). Complexity science: The challenge of complexity in health care. *British Medical Journal*, *323*(7313), 625-628. Retrieved from www.jstor.org/stable/25467871

Plsek, P. E. & Wilson, T. (2001). Complexity, leadership, and management in healthcare organisations. *British Medical Journal*, *323*, 746-749. Retrieved from www.bmj.com

Polit, D. F. & Beck, C. T. (2008). *Nursing research: Generating and assessing evidence for nursing practice* (8th ed.). Philadelphia, PA: Lippincott Williams & Wilkins.

Porter-O'Grady, T. & Malloch, K. (2015). *Quantum leadership: Building better partnerships for sustainable health* (4th ed.). Burlington: MA: Jones & Bartlett.

Pro-Change Behavior Systems, Inc. (2016). The transtheorectical model. Retrieved from http://www.prochange.com/transtheoretical-model-of-behavior-change

Prochaska, J. O., Redding, C. A., Harlow, L. L., Rossi, J. S., & Velicer, W. F. (1994). The transtheoretical model of change and HIV prevention: a review. *Health Education Quarterly, 21*, 471-486.

Proschaska, J. M., Prochaska, J. O., & Levesque, D. A. (2001). A transtheoretical approach to changing organizations. *Administration and Policy in Mental Health, 28*(4), 247-261.

Ross, M. A., Aurora, T., Graff, L., Suri, P., O'Malley, R., Ojo, A., ... Clark, C. (2012). State of the art: Emergency department observation units. *Critical Pathways in Cardiology, 11*(3), 128-138. Retrieved from www.critpathcardio.com

Ross, M. A., Hockenberry, J. M., Mutter, R., Barrett, M., Wheatley, M., & Pitts, S. R. (2013). Protocol-driven emergency department observation units offer savings, shorter stays, and reduced admissions. *Health Affairs, 32*(12), 2149-2156. Retrieved from http://dx.doi.org/10.1377/hithaff.2013.0662

Sarbandi, F., Niknami, S., Hidarnia, A., Hajizadeh, E., & Montazeri, A. (2013). The transtheoretical model (TTM) questionnaire for smoking cessation: Psychometric properties of the Iranian version. *BMC Public Health, 13*(1186). Retrieved from http://dx.doi.org/10.1186/1471-2458-13-1186

Sherwood, K., Sugerman, S., Bossart, P., Bledsoe, J., Barton, E., Bernhisel, K., ... Madsen, T. (2011). EDOU staffing by PAs: What are the effects on patient outcomes? *Journal of The American Academy of Physician Assistants, 24*(8), 31-37. Retrieved from www.jaapa.com

University of Maryland, Baltimore County. (n.d.). Processes of change questionnaire: Smoking version short form. Retrieved from http://habitslab.umbc.edu/files/2014/07/Processes-of-Change-Questionnaire-Smoking-Short-form.pdf

Van der Linden, C., Reijnen, R., & De Vos, R. (2010). Diagnostic accuracy of emergency nurse practitioners versus physicians related to minor illnesses and injuries. *Journal of Emergency Nursing, 36*(4), 311-316. Retrieved from http://dx.doi.org/10.1016/j.jen.200908.012

Wilson, T. & Holt, T. (2001). Complexity science: Complexity and clinical care. *British Medical Journal, 323*(7314), 685-688. Retrieved from www.jstor.org/stable/2547936

Wright, S. (2013). *Hospitals' use of observation stays and short inpatient stays for Medicare beneficiaries* (OEI-02-12-00040). Washington, DC: Government Printing Office.